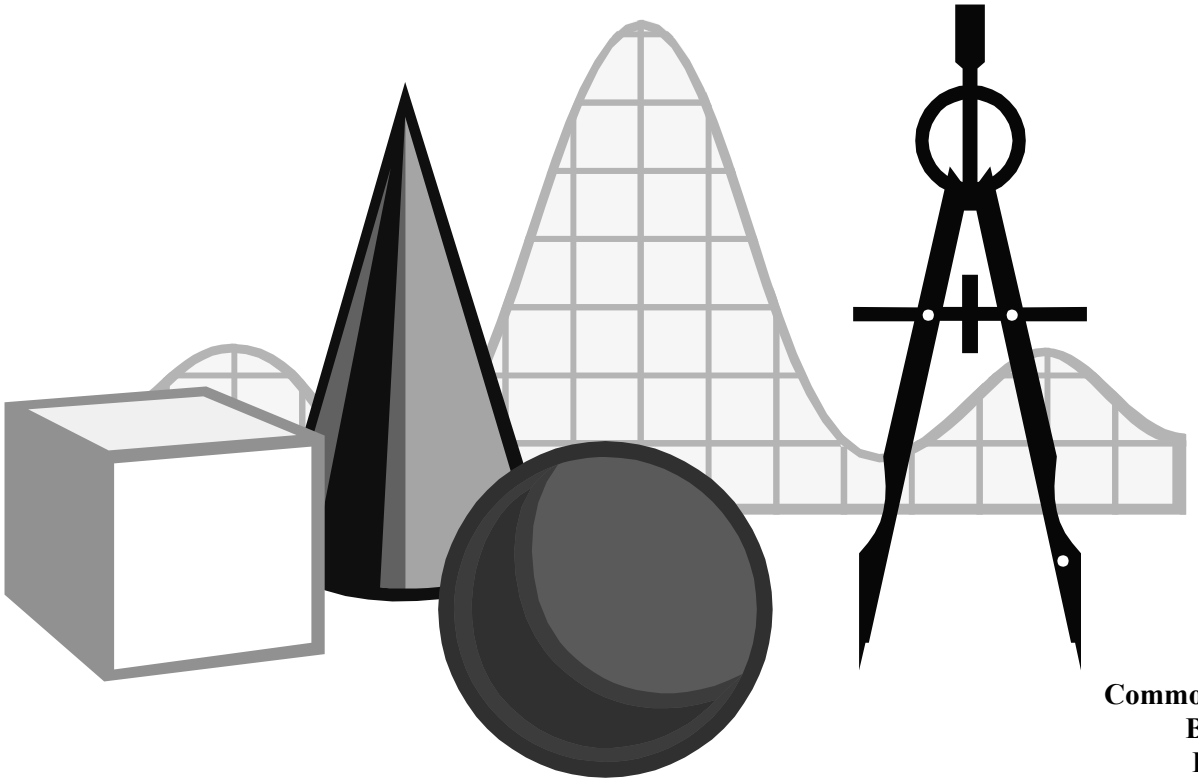
MATHEMATICS STANDARDS OF LEARNING
SAMPLE SCOPE AND SEQUENCE

Grade 7



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Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

by the

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The *Mathematics Standards of Learning Sample Scope and Sequence* and the *Mathematics Standards of Learning Curriculum Framework* can be found in a PDF and Word file format on the Virginia Department of Education's Web site at http://www.pen.k12.va.us

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Preface

As an additional resource to help school divisions develop curricula aligned to the 2001 Mathematics Standards of Learning, the Virginia Department of Education has developed sample scope and sequence documents in kindergarten through grade eight and in core high school courses. These sample documents provide guidance on how the essential knowledge and skills that are identified in the Standards of Learning and the Standards of Learning Curriculum Framework may be introduced to students in a logical, sequential, and meaningful manner.

These sample scope and sequence documents are intended to serve as general guides to help teachers and curriculum developers align their curricula and instruction to support the Standards of Learning. Each sample document is organized around specific topics to help teachers present information in an organized, articulated manner. Also included are correlations to the Standards of Learning for that curricular area for a particular grade level or course, as well as ideas for classroom assessments and teaching resources.

The sample scope and sequence documents are not intended to prescribe how curriculum should be developed or how instruction should be delivered. Instead, they provide examples showing how teachers and school divisions might present to students in a logical and effective manner information that has been aligned with the Standards of Learning. School divisions that need assistance in developing curricula aligned with the Standards of Learning are encouraged to consider the sample scope and sequence guides. Teachers who use the documents should correlate the content identified in the guides with available instructional resources and develop lesson plans to support instruction.

Copies of the sample scope and sequence guides are available at http://www.pen.k12.va.us in both PDF and Microsoft Word formats.

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Introduction

This middle school sample scope and sequence is based on the essential knowledge and skills listed under each Mathematics Standard of Learning in the Curriculum Framework. It is not intended to be a complete list of all the lessons that need to be taught and mastered during the middle school years, but instead organizes the key skills and processes around organizational topics reflective of the focus of the Standards of Learning. An important aspect of these organizational topics is the use of representations and relationships. Students can develop and deepen their understanding of mathematical concepts and relationships as they create, compare, and use various representations to organize and record their thinking about mathematical ideas.

Students in the middle grades use problem solving, mathematical communication, mathematical reasoning, connections, and representations to integrate understanding across the content in the Mathematics Standards of Learning. In the middle grades students build on the concrete reasoning experiences developed in elementary school while developing the deeper mathematical understandings required for success in abstract learning experiences. Students who have successfully completed the middle grades mathematics program should be prepared for high school mathematics course work.

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	SOL Grade 6	SOL Grade 7	SOL Grade 8
Rational Numbers: Representations & Relationships	6.1 6.2 6.4 6.5	7.1 7.14	8.5
Rational Numbers: Operations/Estimation	6.6 6.7 6.8	7.2 7.4 7.5 7.6	8.1 8.3 8.7 8.10
Rational Numbers: Order of Operations		7.2	8.1 8.4
Number Sense/ Number Theory	6.3 6.22	7.1 7.2 7.3 7.5	8.1 8.2 8.5
Proportional Reasoning	6.2	7.6 7.11	8.3 8.17
Measurement: Actual/Estimate	6.9 6.10 6.11 6.12 6.13 6.14	7.7 7.8	8.6 8.7 8.10
Geometry: Basic Ideas	6.11 6.13 6.14 6.15 6.16	7.9 7.10	8.6 8.10

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizing Topic	SOL Grade 6	SOL Grade 7	SOL Grade 8
Geometry: Plane	6.14 6.15	7.7 7.8 7.9 7.10	8.8 8.10
Geometry: Solid	6.17	7.8	8.7 8.9
Geometry: Spatial Relationships	6.17	7.10 7.12 7.13	8.8 8.9 8.16
Data Analysis: Representations & Relationships	6.2 6.8 6.18 6.19	7.16 7.17 7.18	8.12 8.13
Probability	6.2 6.20	7.14 7.15 7.18	8.11
Patterns and Functions: Representations & Relationships	6.21 6.22	7.18 7.19	8.14 8.16 8.17
Algebra: Representations & Relationships	6.23	7.2 7.3 7.20 7.21 7.22	8.4 8.14 8.15 8.16 8.17 8.18

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers: Relationships	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Fraction strips, fraction circles, Fraction Islands, egg cartons, Fraction Towers, base ten blocks, number lines, squares, cubes, Algeblocks ▪ Calculators ▪ Scientific Calculators ▪ Computer software ▪ *Mathematics Curriculum Framework*
	▪ Represent a number in fraction, decimal, and percent forms. Fractions will have denominators of 12 or less. ▪ Compare, order, and determine equivalent relationships among fractions, decimals, and percents. Decimals are limited to the thousandth place, and percents are limited to the tenth place. ▪ Order no more than five numbers written as fractions, decimals, and percents in ascending (least to greatest) or descending (greatest to least) order	7.1		
Rational Numbers: Operations/ Estimation *Include Whole Numbers, Fractions, and Decimals.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Simplify expressions by using the order of operations in a demonstrated step-by-step approach. ▪ Find the value of numerical expressions, using order of operations, mental mathematics, and appropriate tools. Exponents are limited to positive values. Fractions are limited to having denominators of 12 or less. Decimals are limited to the thousandth place.	7.2		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers: Operations/ Estimation (cont'd.)	▪ Determine solutions to everyday problems involving whole numbers, decimals, fractions, and percents. Fractions are limited to having denominators no greater than 12. ▪ Compute the tip and total bill for a meal. ▪ Compute a discount and the resulting (sale) price for one discount. ▪ Compute the sales tax for purchased items. ▪ Compute the simple interest earned on an investment or a loan for a specified number of years and/or months.	7.4	▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: menus, newspaper ads, graph paper, Fraction Islands ▪ Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework*
Number Sense/Number Theory	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Identify the real number equation that represents each property of operations with real numbers, when given several real number equations. ▪ Explore the properties of real numbers, using diagrams and manipulatives. ▪ Test the validity of properties by using examples of the properties of operations on real numbers. ▪ Identify the property of operations with real numbers that is illustrated by a real number equation.	7.3		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers: Operations/ Estimation	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: spinners, dice, games ▪ Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework*
	▪ Write proportions that represent equivalent relationships between two sets. ▪ Solve a proportion to find a missing term. ▪ Apply proportions to solve problems that involve percents.	7.6		
Rational Numbers: Relationships	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Determine the theoretical probability of an event.	7.14		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Number Sense/Number Theory	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: two color counters, Algeblocks, graph paper ▪ Calculators ▪ Computer software ▪ *Mathematics Curriculum Framework*
	▪ Formulate rules for adding integers. ▪ Formulate rules for subtracting integers. ▪ Formulate rules for multiplying integers. ▪ Formulate rules for dividing integers.	7.5		
Rational Numbers Operations/ Estimation	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Solve practical problems involving addition, subtraction, multiplication, and division with integers.	7.5		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Rational Numbers Order of Operations *Include Integers*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: geoboards, squares, cubes, Algeblocks ▪ Graph paper ▪ Calculators ▪ Scientific Calculators ▪ Spreadsheets ▪ Computer Software ▪ *Mathematics Curriculum Framework*
	▪ Simplify expressions by using the order of operations in a demonstrated step-by-step approach. ▪ Find the value of numerical expressions, using order of operations, mental mathematics, and appropriate tools. Exponents are limited to positive values. Fractions are limited to having denominators of 12 or less. Decimals are limited to the thousandth place.	7.2		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Spatial Relations	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: geoboards, Fraction Islands ▪ Graph paper ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry for Middle School Teachers* Staff Development Guide
	▪ Identify by the number of sides or number of angles the following polygons: pentagon, hexagon, heptagon, octagon, nonagon, and decagon. ▪ Draw a pentagon, hexagon, heptagon, octagon, nonagon, and decagon, using a variety of tools.	7.10		
	▪ Identify and label the axes of a coordinate plane. ▪ Identify and label the quadrants of a coordinate plane. ▪ Identify the quadrant in which an ordered pair is positioned by examining the ordered pair. ▪ Graph ordered pairs in the four quadrants of a coordinate plane. ▪ Identify ordered pairs represented by points in the four quadrants of the coordinate plane.	7.12		
	▪ Identify the coordinates of the image of a polygon that has been translated either vertically or horizontally. ▪ Identify the coordinates of the image of a right triangle or rectangle that has been rotated 90° or 180° about the origin. ▪ Sketch the image of a polygon translated vertically or horizontally. ▪ Sketch the image of a right triangle or rectangle that has been rotated 90° or 180° about the origin.	7.13		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Number Sense/Number Theory	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: fraction strips, fraction circles, base ten blocks ▪ Grid paper ▪ Calculators ▪ Scientific Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework*
	▪ Write a number greater than 10 in scientific notation. ▪ Compare, order, and determine equivalent relationships between numbers larger than 10 written in scientific notation. ▪ Compare very large numbers, using scientific notation. ▪ Order no more than five numbers written as fractions, decimals, percents, and numbers larger than 10 written in scientific notation in ascending (least to greatest) or descending (greatest to least) order.	7.1		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Proportional Reasoning	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: geoboards, Fraction Islands, attribute blocks, graph paper ▪ Calculators ▪ Computer software ▪ *Mathematics Curriculum Framework*
	▪ Write proportions that represent equivalent relationships between two sets. ▪ Solve a proportion to find a missing term. ▪ Apply proportions to solve problems that involve percents. ▪ Apply proportions to solve practical problems, including scale drawings. Scale factors shall have denominators no greater than 12 and/or decimals no less than tenths.	7.6		
	▪ Write proportions to express the relationships between the lengths of corresponding sides of similar figures. ▪ Examine congruence of corresponding angles and proportionality of corresponding sides to determine if quadrilaterals or triangles are similar.	7.11		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Basic Ideas	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: attribute blocks, geostrips, geoboards, polygons, triangles, quadrilaterals. ▪ *Mathematics Curriculum Framework* ▪ Grid Paper ▪ Calculators ▪ Computer software ▪ Spreadsheets ▪ DOE *Geometry for Middle School Teachers* Staff Development Guide
	▪ Identify by the number of sides or number of angles the following polygons: pentagon, hexagon, heptagon, octagon, nonagon, and decagon. ▪ Draw a pentagon, hexagon, heptagon, octagon, nonagon, and decagon, using a variety of tools.	7.10		
Measurement Actual/Estimate	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**			
	▪ Subdivide a polygon into rectangles and right triangles, estimate the area of the rectangles and/or right triangles to estimate the area of the polygon, and find the area of the rectangles and/or right triangles to determine the area of the polygon. ▪ Apply perimeter formulas to solve real-life problems. ▪ Apply area formulas to solve real-life problems.	7.7		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Basic Ideas	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: attribute blocks, geostrips, geoboards, solids, graph paper ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry Middle Grades Teachers* Staff Development Guide
	▪ Identify the classification(s) to which a quadrilateral belongs. ▪ Compare and contrast attributes of the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid. ▪ Classify quadrilaterals, using deductive reasoning and inference.	7.9		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Measurement Actual/Estimate *Include Whole Numbers, Fractions, and Decimals.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: attribute blocks, geostrips, geoboards, solids, graph paper ▪ Calculators ▪ Spreadsheets ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Geometry Middle Grades Teachers* Staff Development Guide
	▪ Develop a procedure and formula for finding the surface area of a rectangular prism. ▪ Solve practical problems that require finding the surface area of a rectangular prism. ▪ Develop a procedure and formula for finding the surface area of a cylinder. ▪ Solve practical problems that require finding the surface area of a cylinder ▪ Develop a procedure and formula for finding the volume of a rectangular prism. ▪ Solve practical problems that require finding the volume of a rectangular prism. ▪ Develop a procedure and formula for finding the volume of a cylinder. ▪ Solve practical problems that require finding the volume of a cylinder	7.8		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Data Analysis Representation & Relationships *Include Whole Numbers, Fractions, and Decimals.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Items as data ▪ Graph paper ▪ Calculators ▪ Scientific Calculators ▪ Computer software ▪ Spreadsheets ▪ *Mathematics Curriculum Framework* ▪ DOE *Probability and Statistics* Staff Development Guide
	▪ Examine the range to understand spread or dispersion of the data. ▪ Describe the three measures of central tendency (mean, median, or mode) and situations in which each would best represent the data for data sets with no more than 20 data points. ▪ Solve problems by finding the mean of a set of no more than 20 numbers. ▪ Solve problems by finding the median of a set of data of no more than 20 numbers when the numbers are arranged from least to greatest, including data sets that have one middle number and data sets that have two middle numbers. ▪ Solve problems by finding the mode of a set of data of no more than 20 numbers. ▪ Identify the mode in a set of data, given that there may be one, more than one, or no mode. ▪ Solve problems by finding the range of a set of data of no more than 20 numbers. ▪ Solve problems with multiple identical data points for which the mode is the best descriptor. Two modes are sufficient for data sets with no more than 20 data points	7.16		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Data Analysis Representation and Relationships (cont'd.) *Include Whole Numbers, Fractions, and Decimals.*	▪ Solve problems in which some data points are outliers and thus, for which the median is the best descriptor. The data sets will contain no more than 20 data points. ▪ Solve problems in which the data points are similar and thus, for which the mean is the best descriptor. The data sets will contain no more than 20 data points.	7.16	▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: graphs, chats, tables ▪ Calculators ▪ Computer Software ▪ Spreadsheets with graphing software ▪ *Mathematics Curriculum Framework* ▪ DOE *Probability and Statistics* Staff Development Guide
	▪ Collect, analyze, display, and interpret a data set of no more than 20 items, using frequency distributions. ▪ Collect, analyze, display, and interpret a data set of no more than 20 items, using line plots. ▪ Collect, analyze, display, and interpret a data set of no more than 20 items, using histograms. ▪ Collect, analyze, display, and interpret a data set of no more than 20 items, using stem-and-leaf plots where the stem is listed in ascending order and the leaves are in ascending order with or without commas between leaves. ▪ Collect, analyze, display, and interpret a data set of no more than 20 items, using box-and-whisker plots that identify the minimum, maximum, median, the upper- and lower-extremes, range, and interquartile range. ▪ Collect, analyze, display, and interpret a data set of no more than 20 items, using scattergrams. ▪ Interpret data points in scattergrams as having positive, negative, or no relationship.	7.17		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Data Analysis Representation and Relationships (cont'd.) *Include Whole Numbers, Fractions, and Decimals.*	▪ Organize data not exceeding 20 items into tables and/or graphs that provide a clear representation of dispersion or convergence of the data. ▪ Determine patterns and relationships within data sets (e.g., trends). ▪ Make inferences, conjectures, and predictions based on analysis of a set of data not exceeding 20 items.	7.18	▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: graphs, charts, tables ▪ Calculators ▪ Computer Software ▪ Spreadsheets with graphing software ▪ *Mathematics Curriculum Framework* ▪ DOE *Probability and Statistics* Staff Development Guide

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Probability	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: two-color counter, dice, random number generators, spinners ▪ Graph paper ▪ Calculators ▪ *Mathematics Curriculum Framework* ▪ DOE *Probability and Statistics* Staff Development Guide
	▪ Determine the theoretical probability of an event. ▪ Describe changes in the experimental probability as the number of trials increases. ▪ Investigate and describe the difference between the probability of an event found through simulation versus the theoretical probability of that same event.	7.14		
	▪ Describe the number of possible arrangements of no more than three types of objects, using a tree diagram. ▪ Compute the number of possible arrangements of no more than three types of objects by using the Fundamental (Basic) Counting Principle.	7.15		
	▪ Determine patterns and relationships within data sets (e.g., trends). ▪ Make inferences, conjectures, and predictions based on analysis of a set of data not exceeding 20 items.	7.18		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Patterns and Functions Representation & Relationship	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Pattern Blocks, tables, graphs ▪ Graph paper ▪ Calculators ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Analyze situations to discover a variety of patterns. ▪ Analyze numeric and geometric sequences to discover a variety of patterns.	7.19		
	▪ Determine patterns and relationships within data sets (e.g., trends). ▪ Make inferences, conjectures, and predictions based on analysis of a set of data not exceeding 20 items.	7.18		
	▪ Represent a variety of patterns, using tables, graphs, rules, and words, in order to investigate and describe functional relationships. ▪ Generalize a variety of patterns.	7.19		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Algebra Representation & Relationship *Include Whole Numbers, Fractions, and Decimals.*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Pattern Blocks, tables, graphs, Algeblocks, squares, cubes ▪ Calculators ▪ Scientific Calculators ▪ Computer software ▪ Spreadsheets ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Identify the real number equation that represents each property of operations with real numbers, when given several real number equations. ▪ Explore the properties of real numbers, using diagrams and manipulatives. ▪ Test the validity of properties by using examples of the properties of operations on real numbers. ▪ Identify the property of operations with real numbers that is illustrated by a real number equation.	7.3		
	▪ Simplify expressions by using the order of operations in a demonstrated step-by-step approach ▪ Find the value of numerical expressions, using order of operations, mental mathematics, and appropriate tools. Exponents are limited to positive values. Fractions are limited to having denominators of 12 or less. Decimals are limited to the thousandth place.	7.2		
	▪ Write verbal expressions as algebraic expressions. ▪ Write verbal sentences as algebraic equations.	7.20		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Algebra Representation & Relationship (cont'd.) *Include Whole Numbers, Fractions, and Decimals.*	▪ Apply the following algebraic terms appropriately: equation, inequality, and expression. ▪ Identify examples of equations, inequalities, and expressions.	7.21	▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Pattern Blocks, tables, graphs, Algeblocks ▪ Calculators ▪ Spreadsheets ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Represent and demonstrate steps in solving equations in one variable, using concrete materials, pictorial representation, and algebraic sentences. ▪ Represent and demonstrate steps in solving inequalities in one variable, using concrete materials, pictorial representation, and algebraic sentences. ▪ Translate one-step word problems and practical problems into algebraic equations and solve them.	7.22		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Plane *Use variables in formulas*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Pattern Blocks, polygons, quadrilaterals, triangles, rectangles, tables, graphs ▪ Calculators ▪ Spreadsheets ▪ Compasses ▪ Protractors, angle rulers ▪ Straight edge, rulers ▪ Computer software ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Apply perimeter formulas to solve real-life problems. ▪ Apply area formulas to solve real-life problems.	7.7		
	▪ Compare and contrast attributes of the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid. ▪ Classify quadrilaterals, using deductive reasoning and inference.	7.9		
	▪ Draw a pentagon, hexagon, heptagon, octagon, nonagon, and decagon, using a variety of tools.	7.10		

Grade 7 Mathematics Standards of Learning Sample Scope and Sequence

Organizational Topic	Essential Knowledge and Skills	Related SOL	Sample Classroom Assessment Methods	Sample Resources
Geometry: Solid *Use variables in formulas*	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to**		▪ Student Demonstrations ▪ Individual Quizzes ▪ Group Quizzes ▪ Tests ▪ Projects ▪ Investigations ▪ Portfolios ▪ Questioning Strategies ▪ Peer evaluations	▪ Manipulatives: Pattern Blocks, quadrilaterals, triangles, solids, tables, graphs ▪ Graph paper ▪ Calculators ▪ Computer software ▪ Spreadsheets ▪ *Mathematics Curriculum Framework* ▪ DOE *Patterns, Functions, and Algebra* Staff Development Guide
	▪ Develop a procedure and formula for finding the surface area of a rectangular prism. ▪ Solve practical problems that require finding the surface area of a rectangular prism. ▪ Develop a procedure and formula for finding the surface area of a cylinder. ▪ Solve practical problems that require finding the surface area of a cylinder. ▪ Develop a procedure and formula for finding the volume of a rectangular prism. ▪ Solve practical problems that require finding the volume of a rectangular prism. ▪ Develop a procedure and formula for finding the volume of a cylinder. ▪ Solve practical problems that require finding the volume of a cylinder.	7.8		